TENNESSEE

Gateway Assessment

Item Sampler

Science

Contents

Introduction to Gateway Science

Content of Tests

The testing program titled the *Tennessee Gateway Assessment* was established to meet the Tennessee mandate for high stakes, end-of-course assessments in Tennessee secondary schools. These tests measure the Tennessee Performance Indicators. Subject areas covered by the testing program include Mathematics, Language Arts, and Science.

Test Development

For the *Tennessee Gateway Assessment*, a staff of writers—composed of both teachers and professional test developers experienced in each of the content areas—researched and wrote the items. Professional editors and content specialists carefully reviewed all items and test directions for content and accuracy. To provide a large pool of items for final test selection, the test developers created approximately twice as many items as were needed in the final editions of the tests.

After tryout tests were administered, student responses were analyzed. Professional content editors and researchers carefully reviewed items, their data, and test directions for content, suitability, and accuracy before including particular items and test directions in operational tests.

Test Administration

Tennessee Gateway Assessments are given to students as they near the end of courses that are included in the program. Tests may be given midyear for block schedules or near the end of the school year.

Each test contains 62 multiple-choice questions.

Students will have ample time to read and answer each of the questions. Each test has been designed to be administered in one session and is untimed.

Tips for Students Taking the Test

Preparing for the test

- Review this Tennessee Gateway Item Sampler for Science carefully and thoroughly.

- Acquire a Tennessee Gateway Practice Test for Science, and take the test several times.

- Become familiar with the correct way to mark answers on the answer sheet. There is a sample answer sheet in the Practice Test.

Before the test

- Get a good night's sleep. To do your best, you need to be rested.

During the test

- Relax. It is normal to be somewhat nervous before the test. Try to relax and not worry.

- Listen. Listen to and read the test directions carefully. Ask for an explanation of the directions if you do not understand them.

- Plan your time. Do not spend too much time on any one question. If a question seems to take too long, skip it and return to it later. Answer all questions you are sure of first.

- Think. If you are not sure how to answer a question, read it again and try your best to answer the question. Rule out answer choices that you know are incorrect and choose from those that remain.

Directions for Using the Item Sampler

This Item Sampler for Science provides specific information to students and teachers. It contains examples of different item types for each Performance Indicator that may be tested in any given Gateway test administration. Performance Indicators have been grouped under Reporting Categories. These Reporting Categories will be used to report information regarding performance on the Gateway tests to students, teachers, schools, and systems.

The items in this Item Sampler will not be found in the Gateway tests. The number of items in this Item Sampler does not reflect the emphasis of content on the test. In order to identify the emphasis of content, the Gateway Assessment Practice Test for Science should be used. The Practice Test gives a better representation of content emphasis across Reporting Categories and Performance Indicators.

An Answer Key begins on page 78. Use it to check your answers. Review items that you get wrong.

Reporting Category: Cell Organelles and Biomolecules
Numbers 1 through 10

Performance Indicator: Identify major cell organelles and their functions, given a diagram, description, and/or scenario.

1 **An animal cell is diagrammed below.**
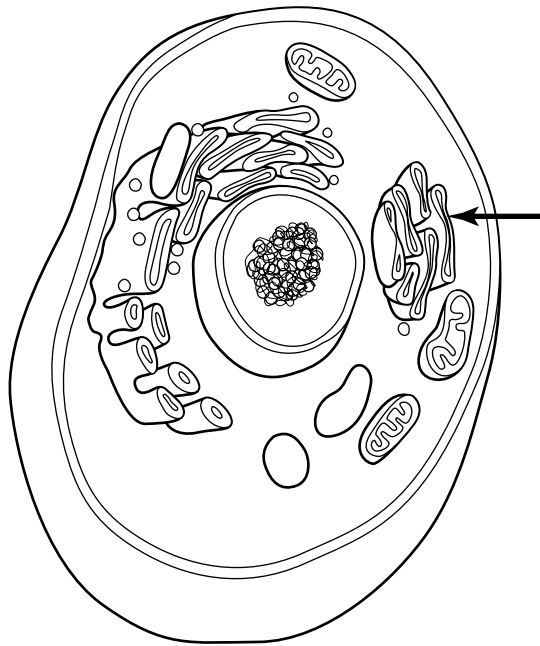
The arrow identifies the organelle responsible for modifying lipids and proteins. What is the name of this organelle?

A lysosome

B Golgi apparatus

C mitochondrion

D endoplasmic reticulum

GS010130

2 A plant cell contains a large membrane-bound, sac-like structure that stores materials such as water, salts, proteins, and carbohydrates. When this sac-like structure is full, it makes the cell rigid, which enables a plant to stand up straight.

This sac-like structure is <u>most</u> likely what organelle?

F nucleus

G vacuole

H chloroplast

J mitochondrion

GS030003

Performance Indicator: Distinguish between plant and animal cells, given diagrams or scenarios.

3 A student in a science laboratory makes a chart to document the structures seen in three different cell samples.

CELL OBSERVATIONS			
STRUCTURE	**SAMPLE 1**	**SAMPLE 2**	**SAMPLE 3**
Nucleus	Yes	Yes	Yes
Cell Wall	No	No	Yes
Mitochondria	Yes	Yes	Yes
Chloroplast	No	No	Yes
Vacuole	Yes	Yes	Yes

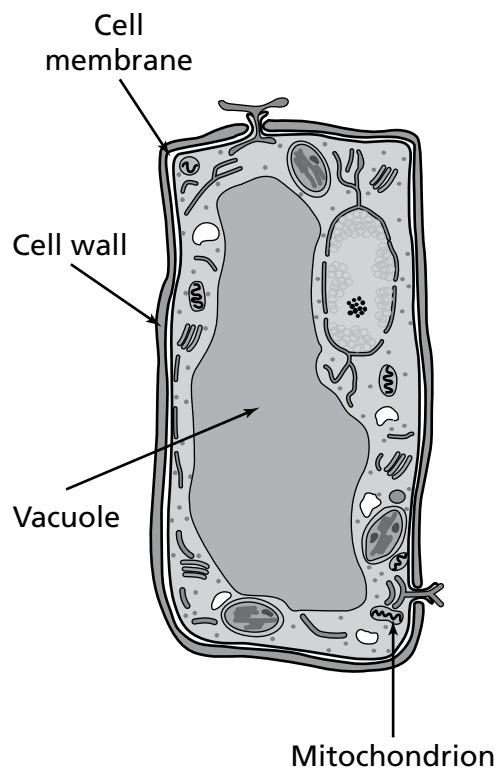| **Cell Shape**			

The student hypothesizes that Sample 3 is a plant cell. What structure in Sample 3 supports this hypothesis?

A nucleus

B mitochondria

C cell wall

D vacuole

GS010131

4 **The diagram below shows a cell.**

Cell membrane

Cell wall

Vacuole

Mitochondrion

The cell shown by the diagram is <u>most</u> likely

F   an animal cell due to the presence of a cell membrane

G   an animal cell due to the presence of a mitochondrion

H   a plant cell due to the presence of a cell wall

J   a plant cell due to the presence of a vacuole

GS020080

Performance Indicator: Distinguish among proteins, carbohydrates, lipids, and nucleic acids, given structural formulas.

5 **Which of these represents the structure of a protein?**

A

NH_2

B

CH_2OH

C

OH H_3C CH_3 OH SH

CH_2 CH CH_2 CH_2

H—N—C—C—N—C—C—N—C—C—N—C—C—OH

D
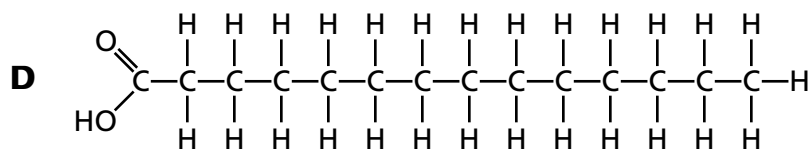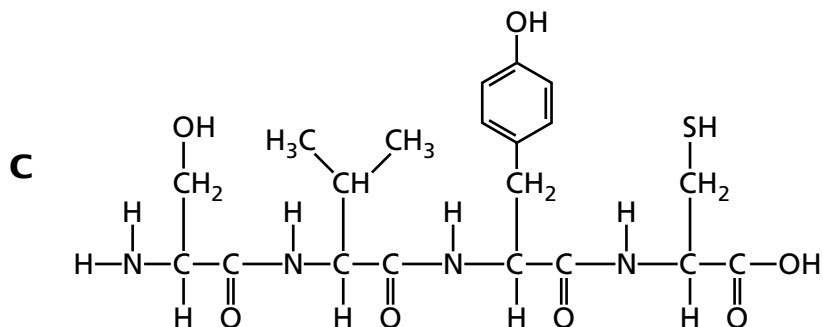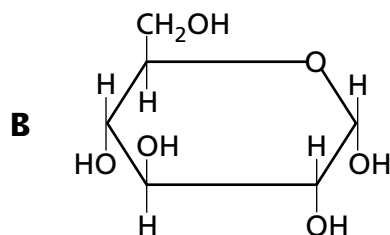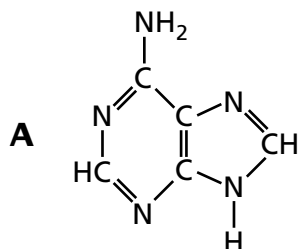
GS000650

6 The structural formula of a molecule is shown below.

What type of molecule is shown in the diagram?

F a lipid

G a protein

H a nucleic acid

J a carbohydrate

GS005113

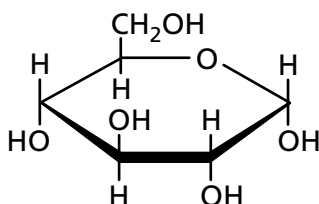**Performance Indicator:** Identify a positive test for carbohydrates and lipids when given an experimental procedure, data, and results.

7 Kayla adds four drops of Benedict's solution to one tablespoon of vanilla pudding mix that is combined with distilled water. She then heats the solution and notes that the color of the mix changed to a reddish-orange color. This test indicates that the vanilla pudding <u>most</u> likely contains

A lipids

B nucleic acids

C proteins

D carbohydrates

GS005116

8 A melted teaspoon of butter is placed on a small piece of brown paper bag and allowed to sit for five minutes. At the end of the five minutes, the remaining butter is wiped off, and a translucent spot remains. This <u>most</u> likely indicates that the butter contains which type of molecule?

F carbohydrate

G protein

H lipid

J nucleic acid

GS030001

Performance Indicator: Identify the biomolecules responsible for communication, response, regulation, or reproduction in the cell.

9 **Enzymes are important in each step of the ATP cycle. What type of molecule is an enzyme?**

   A   lipid
   B   protein
   C   nucleic acid
   D   carbohydrate

GS000618

10 **Hormones regulate many functions and processes that take place in the human body. Hormones belong to which group of biomolecules?**

   F   proteins
   G   nucleic acids
   H   disaccharides
   J   monosaccharides

GS000797

Reporting Category: Cell Processes
Numbers 11 through 24

Performance Indicator: Predict the movement of water molecules across a semi-permeable membrane, given a diagram showing solutions of different concentrations.

11 **The diagram below shows a container divided into two compartments by a membrane permeable to water but not to starch. Two solutions containing different concentrations of dissolved starch were placed on each side of the membrane.**
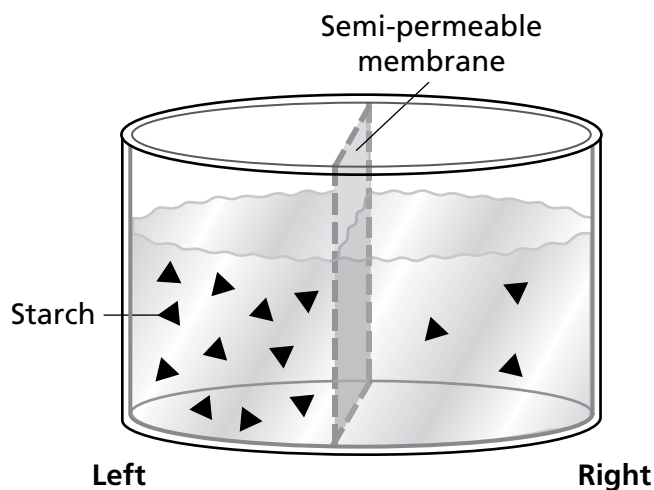
**Which of the following describes what will happen to the water level during the process of osmosis?**

A   The water level on both sides of the membrane will decrease.

B   The water level on the right side of the membrane will increase.

C   The water level on the left side of the membrane will increase.

D   The water level on both sides of the membrane will stay the same.

GS005009

12 An animal cell placed in a sugar solution is shown in the diagram below.

99% Water
1% Sugar

93% Water
7% Sugar
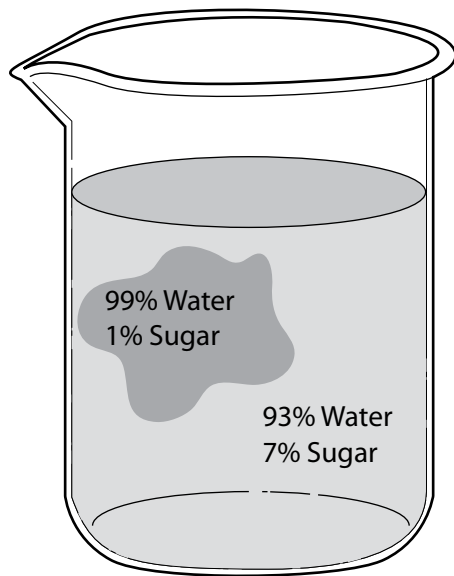
Which statement <u>best</u> describes how osmosis will affect this animal cell?

F   Water will move out of the cell and the cell will shrink.

G   Water will move into the cell and the cell will expand.

H   Sugar will move out of the cell and the cell will expand.

J   Sugar will move into the cell and the cell will expand.

GS010073

Performance Indicator: Sequence a series of diagrams depicting the movement of chromosomes during the cell cycle.
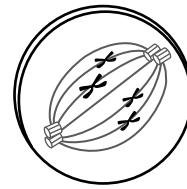
13 **The stages of the cell cycle are shown in random order in the diagrams below.**
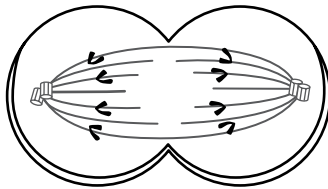
1

2

3
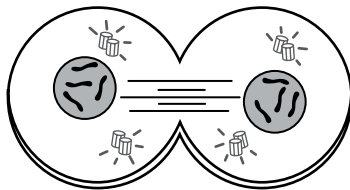
4
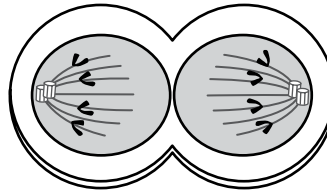
5

What is the correct sequence of diagrams for the cell cycle, beginning with prophase?

A   5, 3, 1, 2, 4

B   3, 1, 4, 2, 5

C   4, 1, 2, 5, 3

D   2, 3, 1, 5, 4

GS010074

14   The diagrams below show the stages of mitosis in random order.
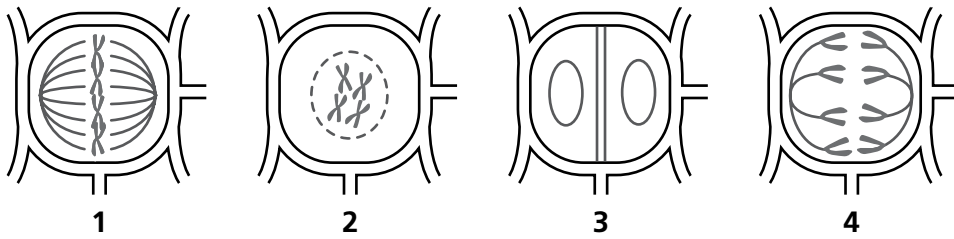
What sequence correctly depicts the stages of mitosis?

F   3-1-2-4

G   1-3-4-2

H   4-2-3-1

J   2-1-4-3

GS020279

Performance Indicator: Compare and contrast the cell cycle in plant and animal cells, given a diagram or description.

15   A cell going through the process of cytokinesis is shown below.
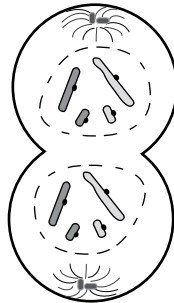
Which of the following <u>best</u> describes the diagram?

A   plant cell forming a cleavage furrow

B   plant cell forming a cell plate

C   animal cell forming a cleavage furrow

D   animal cell forming a cell plate

GS010425

16 What structure in plant cells is formed during cytokinesis that allows the cell to separate into two new daughter cells?

F cell plate

G spindle fibers

H cleavage furrow

J nuclear membrane

GS030002

Performance Indicator: Distinguish between active and passive transport, given examples.

17 In order to make hydrochloric acid, which is required in human digestion, ATP is used to move hydrogen ions from the blood to the stomach lining.

This is an example of

A active transport

B passive transport

C osmotic potential

D facilitated diffusion

GS000824

18 A paramecium is shown below.

Specialized
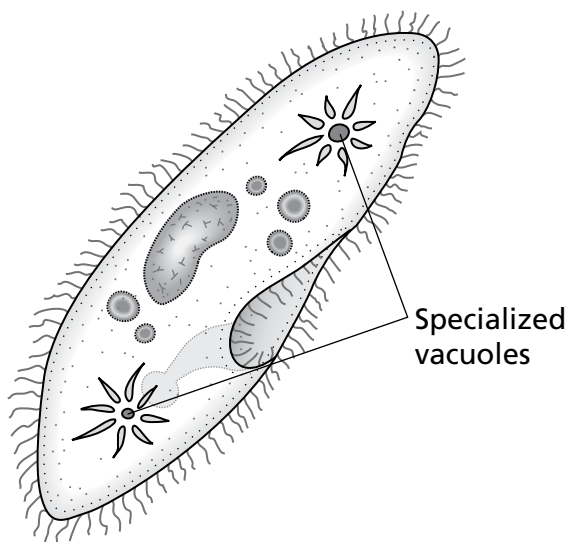vacuoles

This paramecium lives in an environment where water is constantly entering the organism. The paramecium uses specialized vacuoles to pump some of the water back into the environment against a concentration gradient.

Which of these processes is used to pump extra water out of the paramecium?

F osmosis

G diffusion

H active transport

J electron transport

GS001049

Performance Indicator: Evaluate the role of meiosis in maintaining genetic variability and continuity, given a scenario.

19 The population of elephant seals dropped to fewer than 100 animals in the 1890s due to overhunting. The seals are now protected, and the population has increased to nearly 10,000 animals. Meiosis can help variability in a population by

A forming daughter cells identical to the parent cell

B introducing new alleles into the population

C recombining the population's alleles in different ways

D preventing mutated traits from being passed on

GS010359

20 A litter of guinea pigs can vary in color. Some are solid white and some are brown and white, while others are black and white. The color and the pattern of each guinea pig are distinct from those of its parents and siblings.

What process is responsible for the differences seen in each guinea pig?

F meiosis

G mitosis

H replication

J translation

GS020277

Performance Indicator: Determine the number of chromosomes following mitosis or meiosis, given the number of chromosomes in the original cell.

21 A daughter cell that resulted from a mitotic division has 24 chromosomes. How many chromosomes did the parent cell have?

A 5

B 12

C 24

D 48

GS010145

22 A bone cell of a goat contains 60 chromosomes. How many chromosomes will be in each daughter cell after mitosis?

F 15

G 30

H 60

J 120

GS010406

Performance Indicator: Recognize the importance and the mechanisms of homeostasis to the viability of organisms, given a scenario.

23 Which best describes how the body maintains homeostasis when the concentration of carbon dioxide increases?

   A   Blood supply to muscles decreases.

   B   High levels of insulin are secreted.

   C   Glands are triggered to allow for perspiration.

   D   Lung activity is increased to maximize gas exchange.

   GS000471

24 Which of the following reactions helps a human body maintain homeostasis when the weather turns very warm?

   F   shivering and curling up into a ball

   G   sweating and increased blood supply to the skin

   H   sweating and increased blood supply to voluntary muscles

   J   shivering and increased blood supply to voluntary muscles

   GS005136

Reporting Category: Interactions: Between Organisms and Behavior
Numbers 25 through 34

Performance Indicator: Identify commensalism, parasitism, and mutualism, given a scenario with examples.

25 Termites are insects that consume wood fibers as their primary food source. The termites contain organisms called protozoa that live inside their gut and help them digest the cellulose found in the wood fibers. The termite provides the protozoa with food and shelter. These two organisms have a relationship of

   A   mutualism

   B   parasitism

   C   commensalism

   D   predation

   GS010293

26 Fungal mycorrhizae live on the roots of many plants. The mycorrhizae increase the capability of plant roots to absorb nutrients. In return, the plant provides support and a supply of carbohydrates to the mycorrhizae. This is an example of

F predation

G mutualism

H parasitism

J commensalism

GS010294

Performance Indicator: Classify an organism as a producer, consumer, or decomposer, given its behavior.

27 What class of organisms ingests dead and decaying matter, reducing it to simpler molecules that can be reintroduced into the environment?

A consumers

B producers

C decomposers

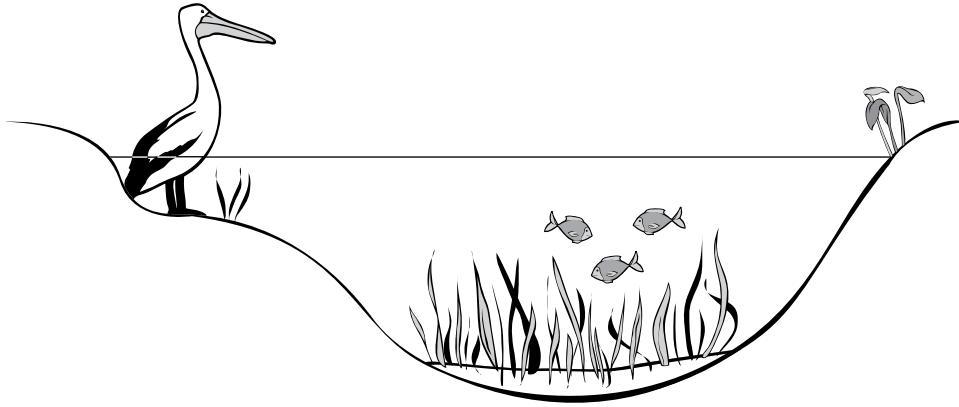**D** omnivores

GS010139

28 Organisms that make up the first level of a food chain and produce their own food are classified as

F predators

G autotrophs

H heterotrophs

J decomposers

GS010140

Performance Indicator: Identify abiotic and biotic factors, given a description or an illustration of an ecosystem.

29 **A diagram of an aquatic ecosystem is shown below.**

Which of the following is an abiotic factor in the ecosystem?

A water temperature

B pelican

C plants

D fish

GS010147

30 **Many species of plants, insects, and small animals can live in a yard. Which of the following is a biotic factor in this ecosystem?**

F flowers

G amount of rainfall

H oxygen given off by plants

J carbon dioxide given off by animals

GS010363

Performance Indicator: Distinguish between a learned and innate behavior, given a description of that behavior.

31 **Which scenario is an example of an innate behavior?**

    A   a sheepdog herding sheep when given a command

    B   a horse going into a stall waiting to be fed

    C   a cat waiting by a door to be let outside

   **D**   a newborn horse trying to stand up shortly after it is born

GS010296

32 **Which action is an example of a learned behavior?**

    F   monarch butterflies migrating

    G   a dog fetching a ball

    H   worker bees foraging for nectar

    J   a cat sharpening its claws on a tree

GS010298

Performance Indicator: Differentiate between the relative age of fossils in sedimentary rock, given a diagram, scenario, or description of rock strata.

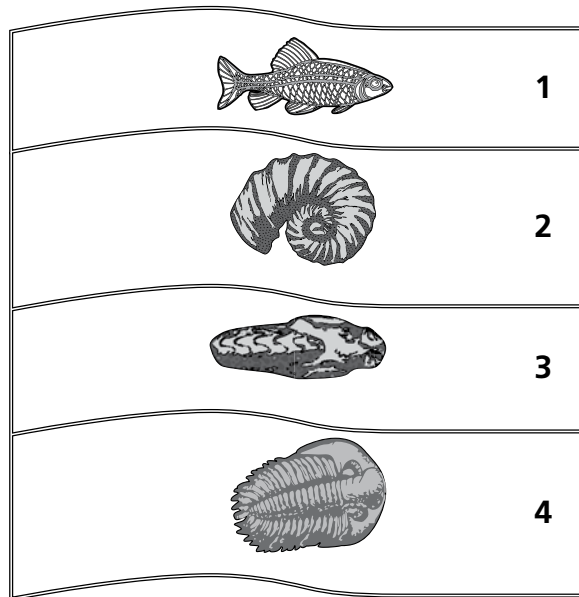**33** **The diagram below shows four fossils in different sedimentary rock layers.**
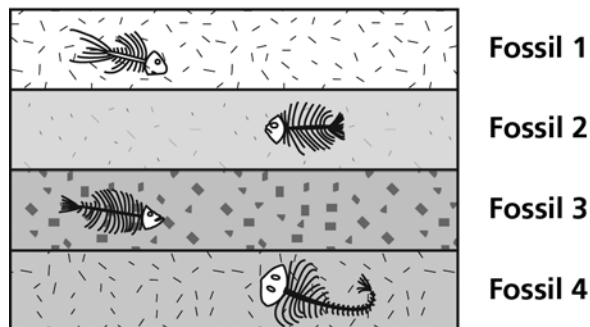
Which fossil is the youngest?

    A   Fossil 1

    B   Fossil 2

    C   Fossil 3

    D   Fossil 4

GS000025

34 **A diagram of rock strata is shown below.**

Which statement best describes the age of the fossils shown in the diagram?

F The fossil in layer one is older than the fossil in layer three.

G The fossil in layer four is younger than the fossil in layer two.

H The fossil in layer two is older than the fossil in layer one.

**J** The fossil in layer three is younger than the fossil in layer two.

GS030005

Reporting Category: Interactions: Population Dynamics and Energy Flow
Numbers 35 through 46

Performance Indicator: Make inferences about how environmental factors affect population growth, given a scenario.

35 **The picture below shows a meadow ecosystem in the Appalachian Mountains. Use this picture to answer the following question.**
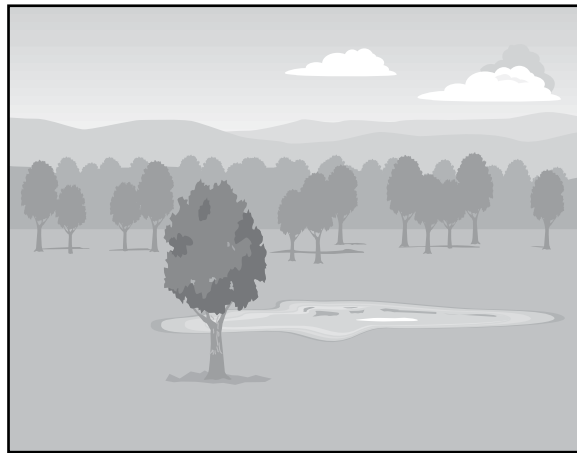
Each spring, water from melting snow creates a shallow, temporary pond in the meadow. The pond lasts for several weeks, and during this time mosquitoes use the pond to reproduce and develop. One winter, a large amount of snow fell and created a much bigger pond the following spring. How would this most likely affect the population of mosquitoes living in the meadow ecosystem?

A   The population of mosquitoes would decrease.

B   The population of mosquitoes would increase.

C   The population of mosquitoes would remain constant.

D   The population of mosquitoes would decrease and then level off.

GS000015

36 Deforestation in tropical rain forests has led to soil erosion and loss of nitrogen from the soil. Insects require nitrogen to make their outer shells.

What will <u>most</u> likely happen to the insect population if deforestation is reduced by international law?

F   The insect population will decrease slowly and then increase.

G   The insect population will increase slowly and then decrease.

H   The insect population will increase slowly and then remain the same.

J   The insect population will decrease slowly and then remain the same.

GS005166

Performance Indicator: Examine the energy flow through the trophic levels of an ecosystem, given a diagram and/or scenario.

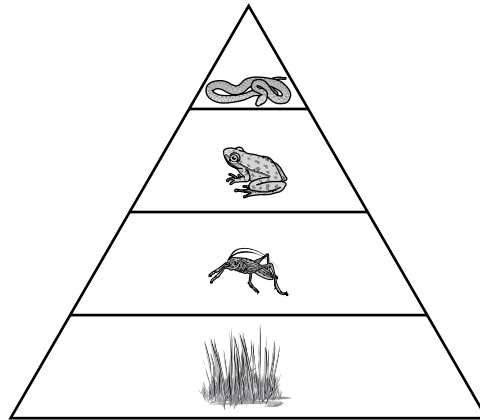**37** An energy pyramid is shown in the diagram below.
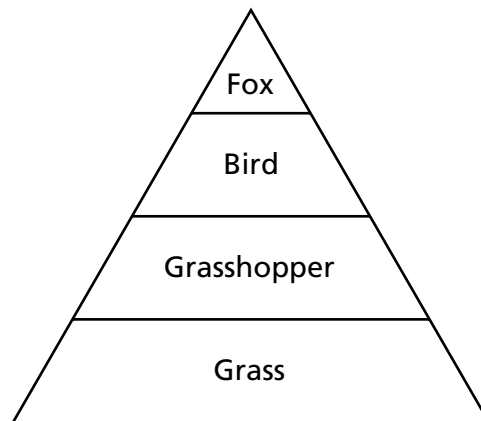
Which organism in the pyramid receives the <u>least</u> amount of energy?

A   fox

B   bird

C   grasshopper

D   grass

GS020087

38 An energy pyramid is shown below.


Which statement **best** describes the flow of energy in the pyramid?

F   10% of the energy is gained as it moves from the grasshopper to the grass.

G   10% of the energy is lost as it moves from the toad to the snake.

H   90% of the energy is gained as it moves from the snake to the toad.

J   90% of the energy is lost as it moves from the grasshopper to the toad.

GS020089

Performance Indicator: Determine the effects of human activities on ecosystems, given a scenario.

39 **A food chain for a lake is shown below.**

Algae → Minnow → Bass → Osprey
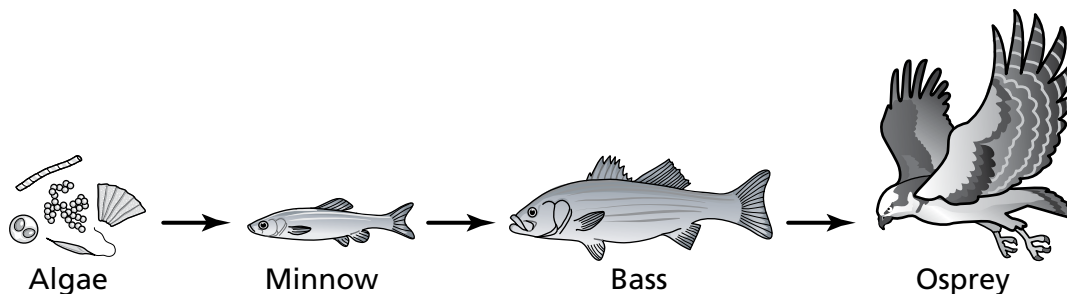
DDT is a chemical that was used to kill mosquitoes around the lake. Some DDT was later found in the water.

According to this food chain, which of these organisms most likely contains the <u>greatest</u> concentration of DDT in its tissues?

A an alga
B a minnow
C a bass
D an osprey

GS001044

40 **Many mammals and birds eat crops and seeds that have been sprayed with pesticides that farmers used to control insect damage. If these animals are eaten, then the pesticides are passed on to their predators. In this way, the pesticides**

F are effectively removed from the food chain
G increase in concentration while moving up the food chain
H decrease in concentration while moving up the food chain
J remain at the same concentration while moving up the food chain

GS010434

Performance Indicator: Analyze and interpret population growth curves, given graphs.

41 **A graph showing the population of two species is shown below.**

### Species A vs Species B
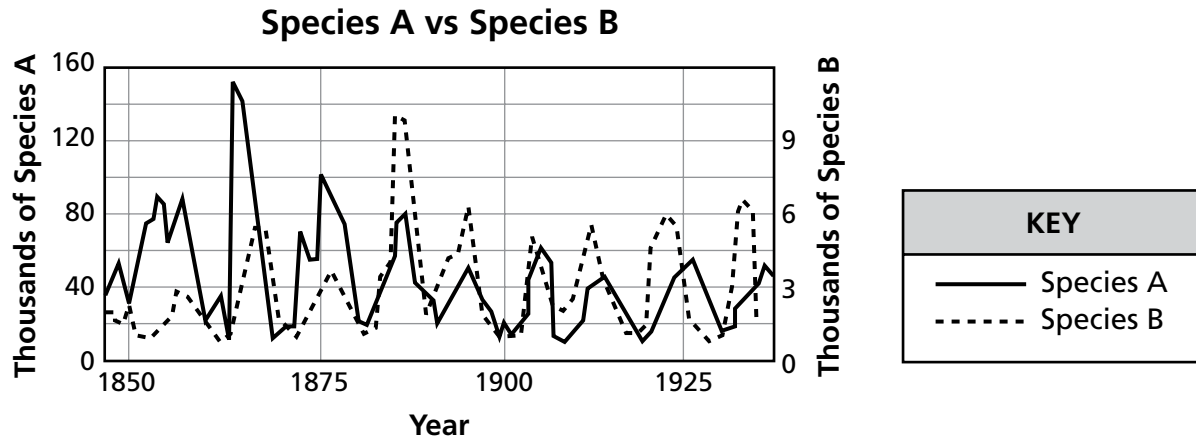
Which of the following is the <u>most</u> likely relationship between the two species?

A Species A and B do not affect one another.

B Species A and B have a symbiotic relationship.

C Species A and B occupy the same niche.

D Species A and B have a predator-prey relationship.

GS005182

42 **The graph below illustrates the size of a paramecia population over time.**

Population of Paramecia
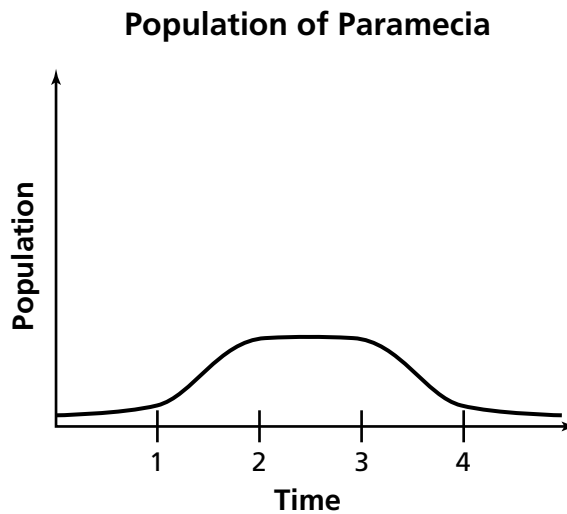
The introduction of a competitor <u>most</u> likely occurred at which point on the graph?

F 4

G 3

H 2

J 1

GS010260

Performance Indicator: Predict how environmental changes affect the formation of a new species or the extinction of an existing species, given a scenario.

43 **Over an extended period of time, what would <u>most</u> likely happen to a population of squirrels separated by a river at the bottom of an 1800-meter-deep canyon?**

A The population would become extinct.

B Two separate species would form.

C The two populations would remain the same.

D The population would undergo an accelerated rate of mutations.

GS010371

44 A species of lizard was found in a tropical forest. After a large volcanic eruption, much of the forest was destroyed, leaving only small patches of forest widely separated by volcanic rock. Each new forest section has conditions that are different from the original forest. Which of the following will <u>most</u> likely happen to the lizards?

F All the lizards will migrate to one common area.

G The different populations of lizards will remain unchanged.

H The lizards will survive and gradually develop into a new species.

J All of the lizards will become extinct.

GS010411

Performance Indicator: Differentiate between natural selection and selective breeding, given a scenario.

45 Some animals in nature adapt to their changing environment. Those that are successful are able to reproduce and pass on their traits to future generations. This is an example of

A commensalism

B mutualism

C natural selection

D selective breeding

GS010307

46 The Clydesdale is a large breed of horse that was used for specific farming purposes, such as plowing and pulling wagons. The biggest and most muscular male horses were crossed with the biggest and most muscular females to produce the strongest offspring possible. This is an example of

F cloning

G natural selection

H recombinant DNA

J selective breeding

GS030009

Reporting Category: Photosynthesis and Respiration
Numbers 47 through 58

Performance Indicator: Identify the reactants and products of photosynthesis and/or respiration, given equations.

47 **Which of the following statements is correct about the two reactions shown below?**

Carbon dioxide + Water + Sunlight $\longrightarrow$ Sugar + Oxygen

Sugar + Oxygen $\longrightarrow$ Water + Carbon dioxide + Energy

A   Oxygen is used to release energy during photosynthesis.
B   Sugar is broken down to release energy during respiration.
C   Water is broken down to release energy during respiration.
D   Carbon dioxide is used to release energy during photosynthesis.

GS005192

48 **The equation for photosynthesis is shown below.**

$$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$$
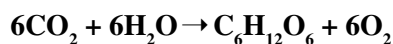
What are the products of photosynthesis?

F CO_2 and H_2O
G $C_6H_{12}O_6$ and H_2O
H CO_2 and $C_6H_{12}O_6$
J $C_6H_{12}O_6$ and O_2

GS030004

Performance Indicator: Identify the cell organelle in which photosynthesis and respiration occur, given a diagram.

49 **A diagram of a plant cell is shown below.**

Chloroplast

Mitochondrion

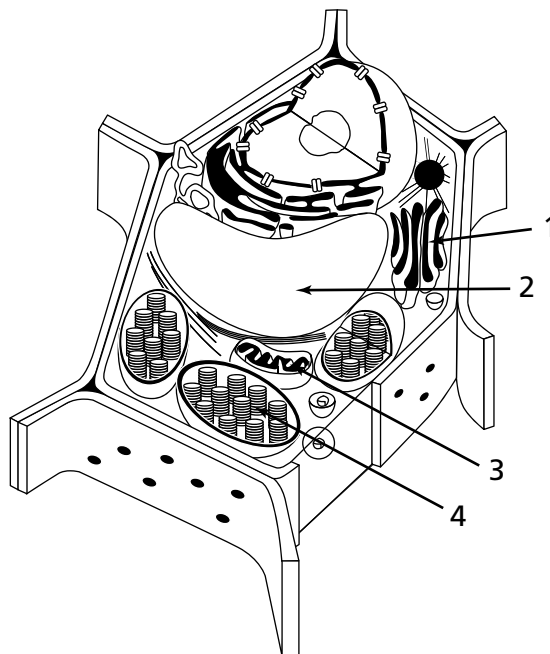Endoplasmic reticulum
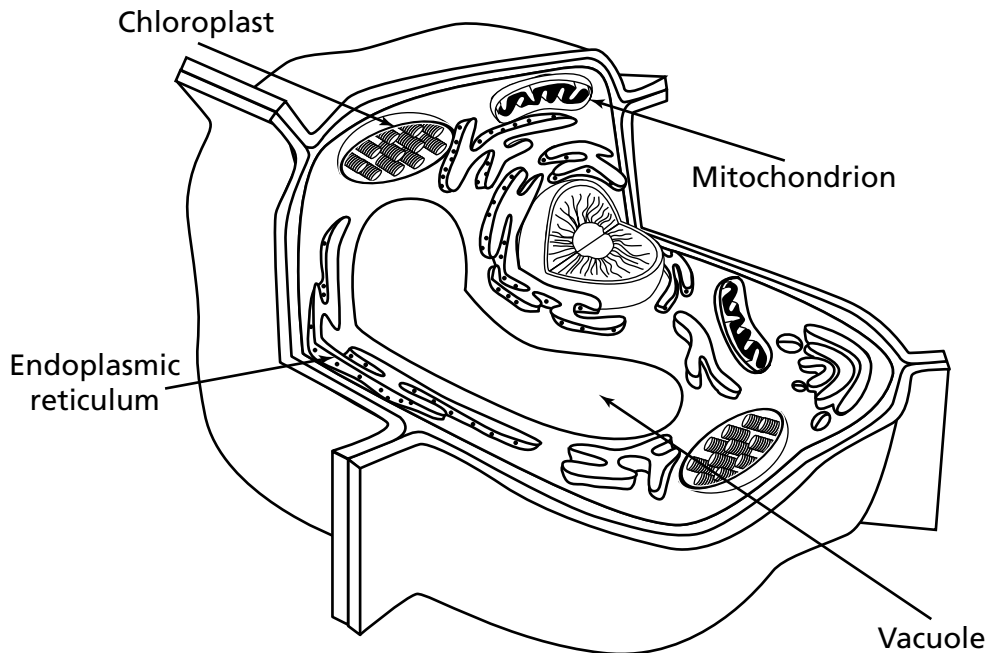
Vacuole

Photosynthesis occurs in which organelle?

A   chloroplast

B   endoplasmic reticulum

C   vacuole

D   mitochondrion

GS010397

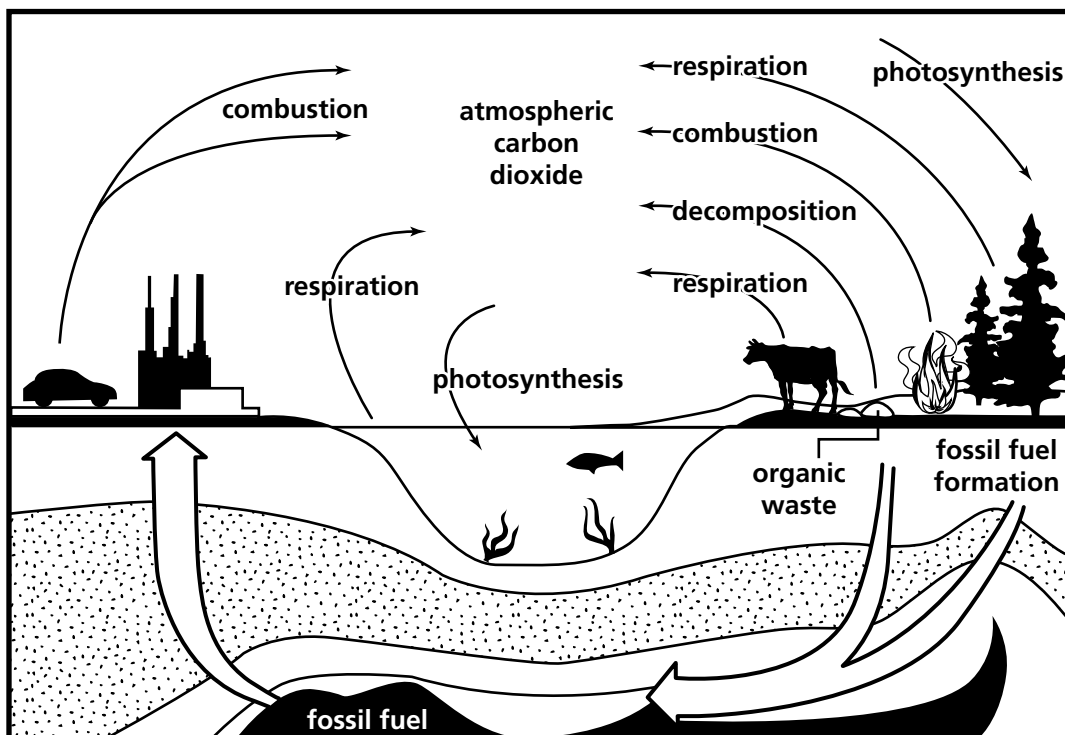**50** A plant cell is shown in the diagram below.

What numbered arrow in the diagram represents the chloroplast?

F 1

G 2

H 3

J 4

GS010398

Performance Indicator: Interpret a diagram of the carbon-oxygen cycle.

51 **A diagram of the oxygen-carbon dioxide cycle is shown below.**


Some of the atmospheric carbon dioxide comes from the process of combustion. Which of the following represents one way in which carbon dioxide is produced through combustion?

A plants going through photosynthesis

B animals going through cellular respiration

C the decomposition of organic matter

D the burning of fossil fuels

GS010374

52   **The carbon dioxide-oxygen cycle is diagrammed below.**
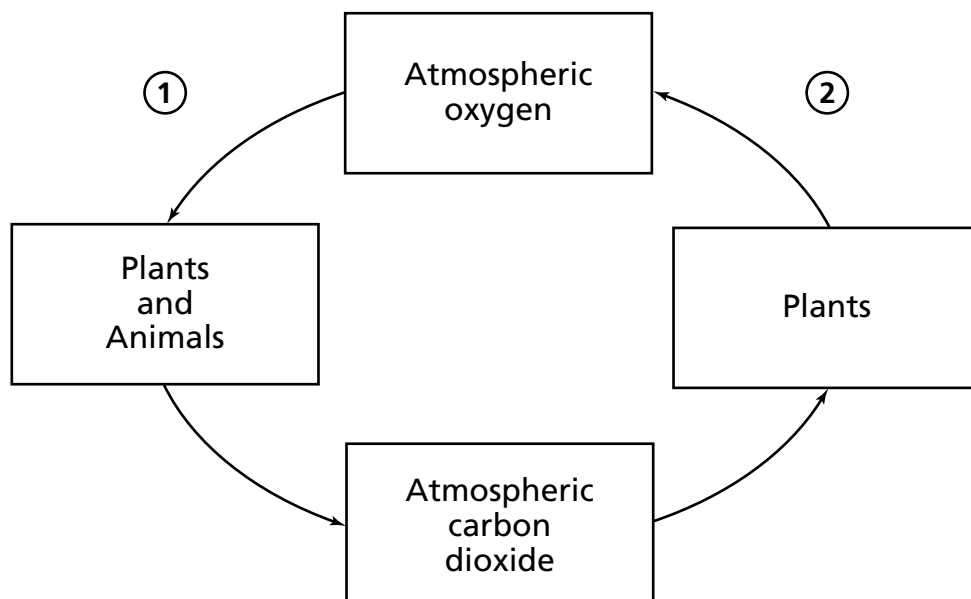
What processes belong in the numbered parts of the diagram?

F   1 chemosynthesis; 2 photosynthesis

G   1 photosynthesis; 2 respiration

H   1 respiration; 2 photosynthesis

J   1 transpiration; 2 respiration

GS010375

Performance Indicator: Distinguish between aerobic and anaerobic respiration in terms of the presence or absence of oxygen and ATP produced.

53   **Which process requires the presence of oxygen to produce energy?**

A   glycolysis

B   anaerobic respiration

C   transpiration

D   aerobic respiration

GS010308

**54** Which process has a net production of two ATP molecules and lactic acid?

F photosynthesis

G chemosynthesis

H aerobic respiration

J anaerobic respiration

GS010309

Performance Indicator: Investigate the interdependence of photosynthesis and respiration in living organisms, given a diagram or scenario.

55 A diagram of the respiration-photosynthesis cycle is shown below.

Respiration-Photosynthesis Cycle
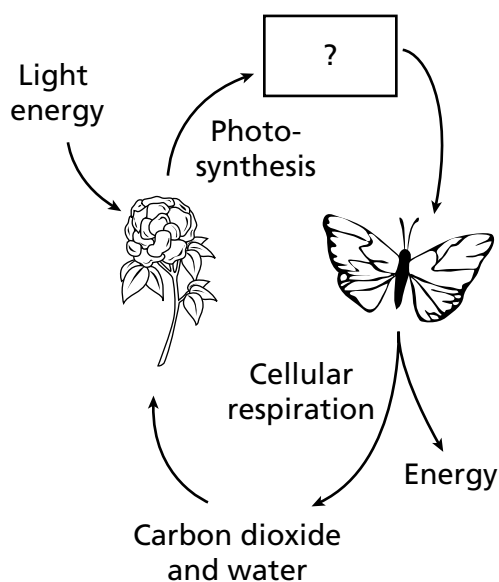
What product of photosynthesis and reactant for respiration belongs in the box to complete the cycle?

A hormones

B chlorophyll

C ATP and ADP

D glucose and oxygen

GS010166

56 **The processes of photosynthesis and respiration allow plants and animals to recycle oxygen and carbon dioxide. Which statement best expresses this relationship?**

    F   The products of photosynthesis inhibit respiration.

    G   The products of photosynthesis are the products of respiration.

    H   The products of photosynthesis are the reactants of respiration.

    J   The reactants of photosynthesis are the reactants of respiration.

GS010431

Performance Indicator: Relate how energy is transferred from cellular energy to cellular work.

57 **The ATP cycle is diagrammed below.**
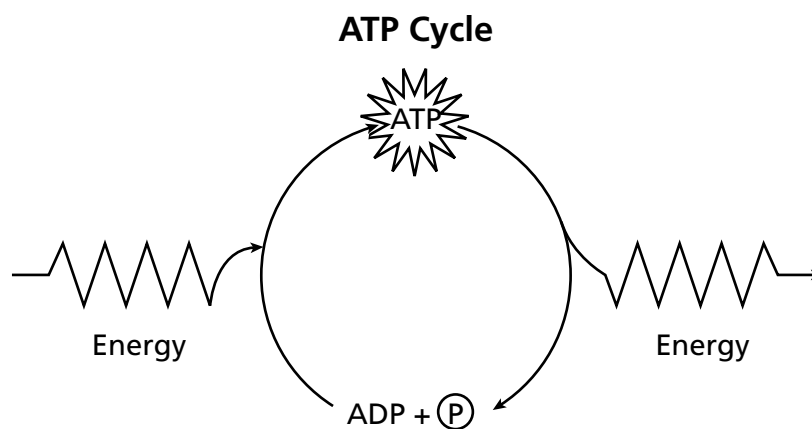
ATP Cycle

Energy is released from the ATP cycle when

    A   a phosphate is removed from ATP

    B   a sugar is added to ATP

    C   a phosphate is added to ADP

    D   a sugar is removed from ADP

GS010183

58 When ATP changes to ADP, the phosphate bonds are broken, allowing energy to be

 F stored

 G released

 H created

 J gained

GS010422

Reporting Category: **Genetics**
Numbers 59 through 72

Performance Indicator: Distinguish between asexual and sexual methods of reproduction, using a scenario.

59 A haploid cell (1n) unites with another 1n cell to form a diploid cell (2n). Which process is taking place?

 A mitosis

 B asexual reproduction

 C sexual reproduction

 D cloning

GS020025

60 In some types of plants, breaking off a single part of a plant can create a new plant. This new plant is genetically identical to the original plant. This is an example of

 F an adaptation

 G a mutation

 H sexual reproduction

 J asexual reproduction

GS020049

Performance Indicator: Identify dominant and recessive traits, given the results of a monohybrid cross in a scenario.

61 **A person can have either straight or bent pinky fingers. A woman who is homozygous for bent pinky fingers has children with a man who has straight pinky fingers. All of their children have bent pinky fingers. The trait for bent pinky fingers is an example of a trait that is**

   A dominant

   B recessive

   C codominant

   D incompletely dominant

   GS010399

62 **A woman with attached earlobes has a child with a man who has unattached earlobes. This couple has three children, and all of them have unattached earlobes. The trait for attached earlobes is <u>most</u> likely**

   F dominant

   G recessive

   H codominant

   J incompletely dominant

   GS030007

Performance Indicator: Determine the genotype and phenotype of a monohybrid cross, given a Punnett square.

63 **A Punnett square showing a cross between two cats is shown below.**

HH × hh

	h	h
H		
H		

In cats, short hair (H) is dominant to long hair (h). If a cat that is homozygous for short hair is crossed with a cat that has long hair, what is the probability the offspring from this cross will have long hair?

A   0%

B   25%

C   50%

D   100%

GS010112

64 **The characteristic for curly hair (C) is dominant to the characteristic for straight hair (c). A cross between two individuals for hair type is shown in the Punnett square below.**

	?	?
?	CC	Cc
?	CC	Cc

**What must the genotype of the parents be to produce the results shown in the Punnett square?**

F   homozygous dominant $\times$ homozygous dominant

G   homozygous dominant $\times$ heterozygous

H   homozygous recessive $\times$ homozygous dominant

J   heterozygous $\times$ heterozygous

GS010311

Performance Indicator: Identify the sex chromosomes in humans and recognize inheritance patterns that are sex-linked (X-linked), using a pedigree or scenario.

65 **A pedigree is shown below.**
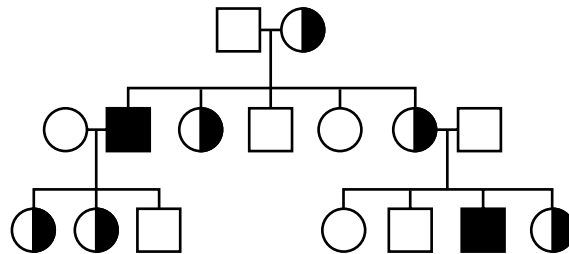
Key	
○	= Unaffected Female
□	= Unaffected Male
◑	= Carrier Female
●	= Affected Female
■	= Affected Male

What type of trait is shown in the pedigree?

A   sex-linked recessive

B   sex-linked dominant

C   autosomal recessive

D   autosomal dominant

GS010090

66 A pedigree of a family with red-green color blindness, a sex-linked recessive genetic disorder, is diagrammed below.
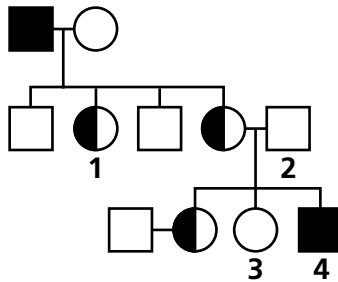
Key	
○	= Unaffected Female
□	= Unaffected Male
◑	= Carrier Female
●	= Affected Female
■	= Affected Male
b	= Red-green color blindness

What is the genotype of individual 3?

F $X^B X^B$

G $X^b Y$

H $X^b X^b$

J $X^B Y$

GS010091

Performance Indicator: Analyze modes of inheritance including co-dominance, incomplete dominance, polygenic, and multiple alleles using genetic problems or Punnett squares.

67 Red blood cells are classified as type A or type B, based on their surface antigens. Type O blood does not contain any antigens. The chart below shows the possible phenotypes of each blood type.

Blood Types

Blood Type	Phenotype Alleles
A	$I^A I^A$; $I^A i$
B	$I^B I^B$; $I^B i$
AB	$I^A I^B$
O	ii

Which mechanism explains how both A and B antigens produce type AB blood?

A complete dominance

B polygenic inheritance

C codominance

D incomplete dominance

GS010291

68 A plant with red flowers is crossed with a plant that has white flowers. The offspring all have pink flowers. This is an example of what type of inheritance?

F recessive

G polygenic

H codominance

J incomplete dominance

GS010323

Performance Indicator: Determine the probability of having a child with an autosomal disorder, such as cystic fibrosis or Tay-Sachs, given a scenario or genetic problem.

69 **What is the probability that an offspring will inherit cystic fibrosis, an autosomal recessive disorder, if both parents are carriers?**

A   0%

B   25%

C   75%

D   100%

GS010408

70 **Tay-Sachs is a recessive disorder that destroys nerve cells in the brain and spinal cord. The Punnett square below represents a cross of two people who are both carriers of Tay-Sachs.**

Tt × Tt

What is the probability that an offspring from this cross will inherit Tay-Sachs?

F   0%

G   25%

H   50%

J   100%

GS020030

Performance Indicator: Analyze a dihybrid cross to determine the probability of a particular trait, given a completed Punnett square.

71 In a certain set of lab mice, black hair (B) is dominant to white hair (b), and coarse hair (C) is dominant to fine hair (c). The Punnett square below shows a cross between a heterozygous black, fine-haired mouse and a white heterozygous, coarse-haired mouse.

Bbcc x bbCc

	bC	bC	bc	bc
Bc	BbCc	BbCc	Bbcc	Bbcc
Bc	BbCc	BbCc	Bbcc	Bbcc
bc	bbCc	bbCc	bbcc	bbcc
bc	bbCc	bbCc	bbcc	bbcc

Key
B = Black hair
b = White hair
C = Coarse hair
c = Fine hair

What is the probability this cross will produce black, coarse-haired offspring?

A $\dfrac{2}{16}$

B $\dfrac{4}{16}$

C $\dfrac{8}{16}$

D $\dfrac{10}{16}$

GS020034

72 **The Punnett square below shows a cross between two pea plants. Both are heterozygous for seed texture and heterozygous for seed color.**

AaBb x AaBb

Key
AA - Green
BB - Smooth
aa - Yellow
bb - Rough

	AB	Ab	aB	ab
AB	AABB	AABb	AaBB	AaBb
Ab	AABb	AAbb	AaBb	Aabb
aB	AaBB	AaBb	aaBB	aaBb
ab	AaBb	Aabb	aaBb	aabb

What is the probability an offspring will have green seed color and rough seed texture?

F $\dfrac{1}{16}$

G $\dfrac{3}{16}$

H $\dfrac{4}{16}$
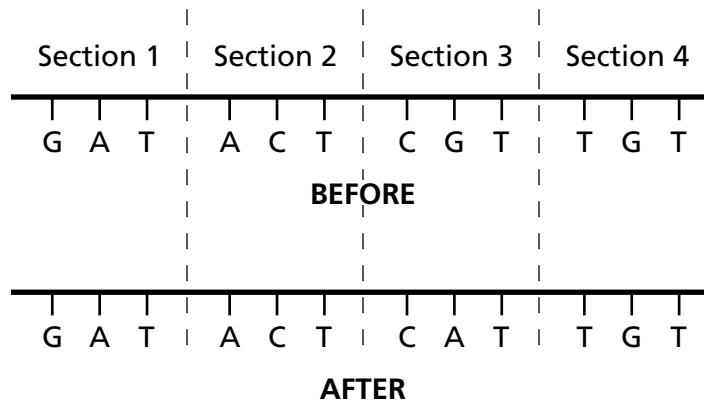
J $\dfrac{9}{16}$

GS020109

Reporting Category: Biotechnology and DNA
Numbers 73 through 82

Performance Indicator: Relate changes in the DNA instructions that cause mutations, given diagrams.

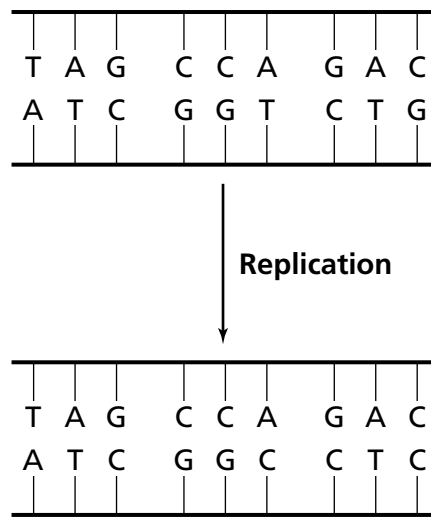**73** **The diagram below shows a DNA molecule that contains a mutation after the replication process.**

Section 1 | Section 2 | Section 3 | Section 4

G A T | A C T | C G T | T G T

BEFORE

G A T | A C T | C A T | T G T

AFTER

In which section of the DNA molecule is the mutation located?

A   Section 1
B   Section 2
C   Section 3
D   Section 4

GS000300

74 **The diagram below represents a DNA molecule before and after replication.**

```
| | |   | | |   | | |
T A G   C C A   G A C
A T C   G G T   C T G
| | |   | | |   | | |
```

Replication

↓

```
| | |   | | |   | | |
T A G   C C A   G A C
A T C   G G C   C T C
| | |   | | |   | | |
```

What will <u>most</u> likely be the effect of the change in the DNA molecule?

F The organism will be unable to reproduce.

G The change will cause a harmful mutation.

H The DNA molecule will be unable to replicate.

J The DNA molecule will code for a different protein.

GS020035

Performance Indicator: Recognize the major functions of DNA as replication or transcription, (and translation) given diagrams and/or descriptions.
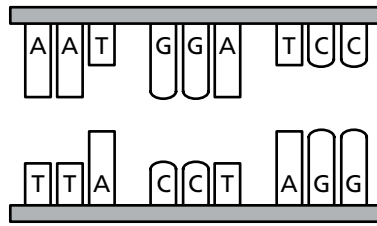
75 **A function of a DNA molecule is shown below.**
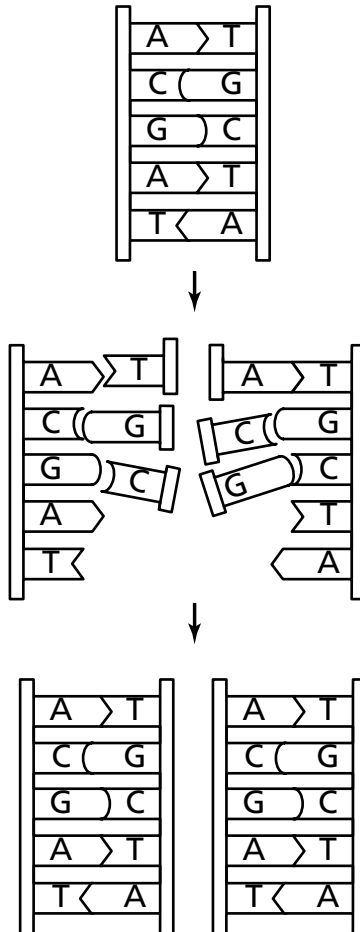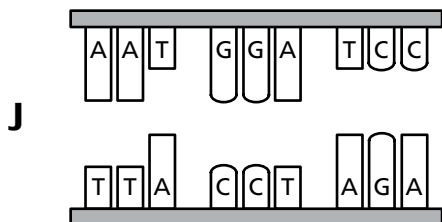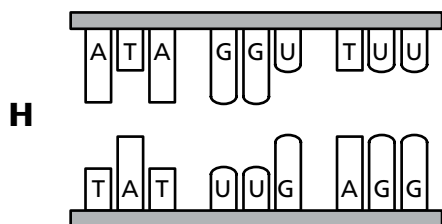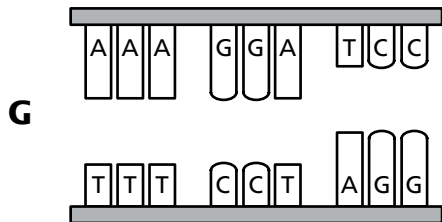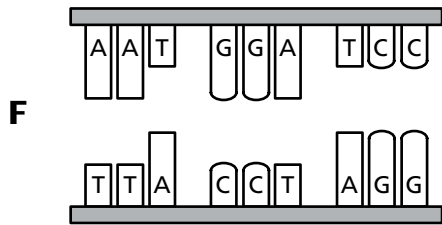

What process is represented by the diagram?

A   mutation

B   translation

C   replication

D   transcription

GS010170

76 **The diagram below represents a DNA molecule.**

AAT GGA TCC

TTA CCT AGG

Which of the following represents the DNA molecule that results from replication if no mutations occur?

F

AAT GGA TCC

TTA CCT AGG

G

AAA GGA TCC

TTT CCT AGG

H

ATA GGU TUU

TAT UUG AGG

J

AAT GGA TCC

TTA CCT AGA

GS010389

Performance Indicator: Analyze DNA fingerprinting using an illustration of DNA (bands).

77 **The DNA bands from five organisms are shown below.**

DNA Bands				
Organism 1	Organism 2	Organism 3	Organism 4	Organism 5

According to the diagram, what organism is <u>most</u> likely related to Organism 1?

A Organism 2

B Organism 3

C Organism 4

D Organism 5

GS010403

78 The DNA profile of four organisms is shown below.

DNA Profile			
Organism 1	**Organism 2**	**Organism 3**	**Organism 4**

Which piece of information is <u>most</u> likely to be obtained from this analysis?

F   the diet of the organisms

G   the size of the organisms

H   the ecological niche of the organisms

J   the relatedness among the organisms

GS020083

Performance Indicator: Differentiate the processes of replication, transcription, and translation, given descriptions and/or diagrams.

79 **Which diagram best represents translation?**
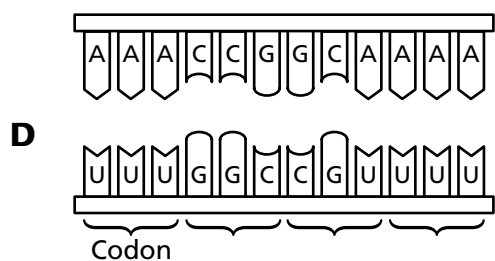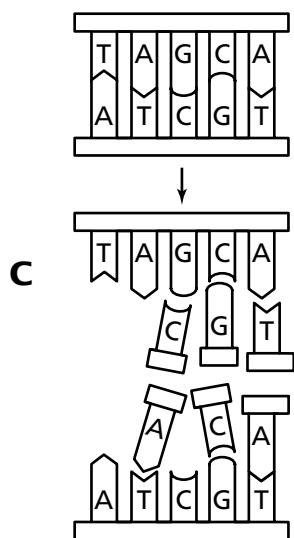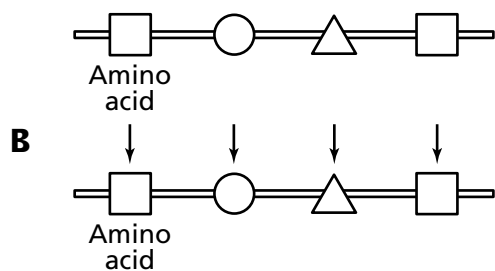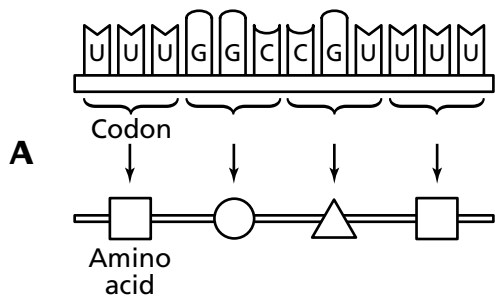
GS010057

80 **A portion of an mRNA molecule is shown below.**
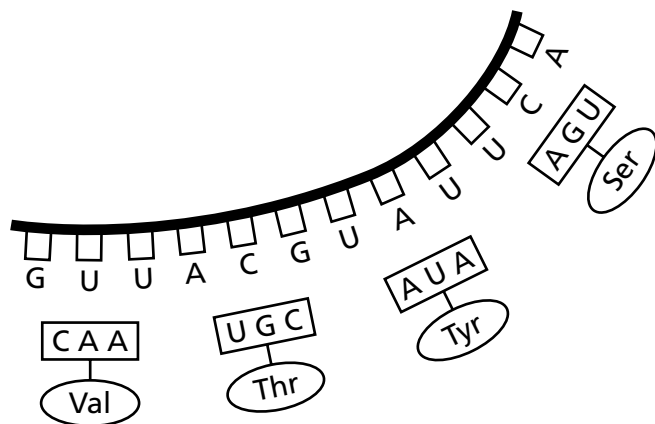
The diagram represents which process?

F   translation

G   transcription

H   replication

J   fragmentation

GS020045

Performance Indicator: Recognize the relatedness of species using illustrations of anatomical structures, protein sequences, and/or DNA bands.

81 **A table showing a portion of DNA base sequences is shown below.**

DNA Base Sequences

Species	Sequence
1	T A C C A
2	A T G C T
3	G C C G A
4	C T G C T

Which two species are <u>most</u> closely related?

A   1 and 2

B   2 and 3

C   2 and 4

D   1 and 4

GS020298

82 DNA bands from four different species are shown below.

DNA Bands			
Species 1	Species 2	Species 3	Species 4

Based on the diagram, which two species are <u>most</u> likely to be related?

F 1 and 3

G 1 and 4

H 2 and 3

J 2 and 4

GS020316

Reporting Category: Diversity: Biomes and Classification
Numbers 83 through 94

Performance Indicator: Infer animals or plants indigenous to an environment, given pictures or diagrams of the organisms and a description of the environment.

83 The air temperature within the Arctic Circle can reach as low as –30˚C. Which of the animals below is <u>best</u> adapted to survive these low temperatures?

A

B
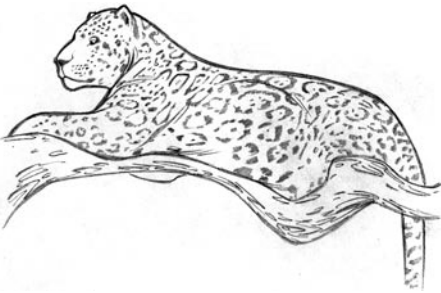
C

D

GS010061

84 A diagram of an animal is shown below.

This animal has ears that are shorter than usual to conserve body heat. Its feet are big and furry. Its fur is brown in the summer and white in the winter. This organism is <u>most</u> likely to be found in an environment with what characteristics?

F   hot, dry area with little plant growth

G   cold environment with snow most of the year

H   humid forest with many broad-leaved trees

J   cool, grassy area with many shrubs

GS010334

Performance Indicator: Infer the biome in which an animal or plant lives, given a description of the organism and pictures of various biomes.

85 **A particular mammal has a distinctive striping pattern, four one-toed hooves, and eats a variety of grasses and other plants. This animal requires little water and is not very cold tolerant. This animal would <u>most</u> likely be found in which biome?**

A

C
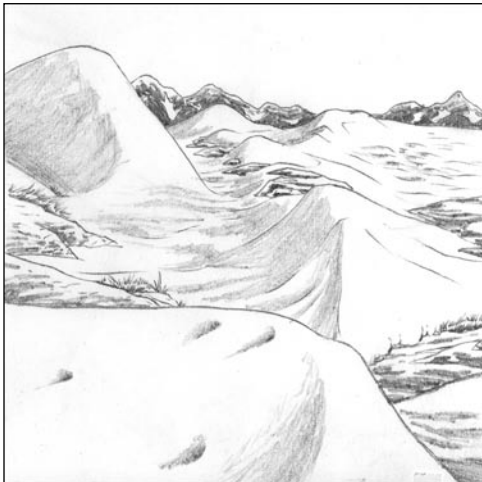
B

D

GS010246

86 A certain animal lives in a hot, arid area that receives little rainfall. This animal is active at night and eats grasses, leaves, and roots. It swallows its food without chewing it and later regurgitates a cud to chew on to break down the fibrous plant material. This animal needs very little water and digs its own water wells. In which biome is this animal <u>most</u> likely found?

F

G

H
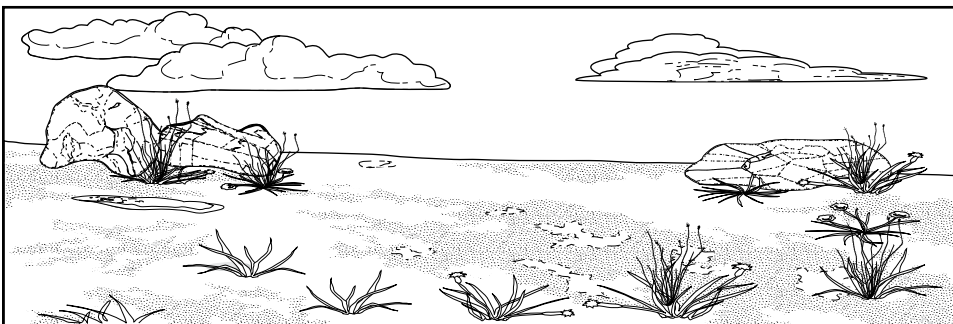
J

GS030006

Performance Indicator: Infer the relatedness of different organisms using the Linnaean system of classification, given pictures and/or descriptions of a variety of different plants or animals and a classification key.

87 **A chart showing the classification of organisms is shown below.**

ORGANISM CLASSIFICATION CHART

	Organism 1	Organism 2	Organism 3	Organism 4
Order	Cetacea	Sirenia	Sirenia	Cetacea
Family	Balaenopteridae	Trichechidae	Dugongidae	Balaenopteridae
Genus	*Balaenoptera*	*Trichecus*	*Dugong*	*Balaenoptera*
Species	*musculus*	*manatus*	*dugon*	*acutorastrata*

Which two organisms are <u>most</u> closely related?

A   1 and 2

B   1 and 4

C   2 and 3

D   2 and 4

GS010400

88 A chart showing the relatedness of six species is shown below.

Relatedness Chart

		Jaws	Lungs	Claws or Nails	Feathers	Fur; Mammary Glands
Hagfish						
Perch		X				
Salamander		X	X			
Lizard		X	X	X		
Pigeon		X	X	X	X	
Mouse		X	X	X		X

Which two organisms are the least related?
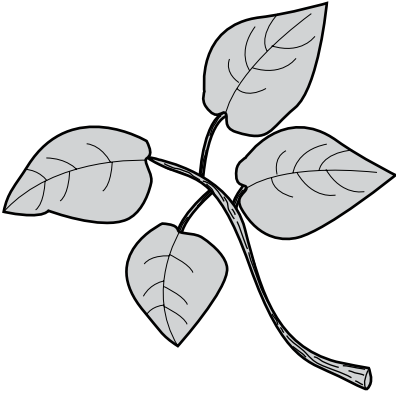
F pigeon and mouse

G salamander and hagfish

H lizard and pigeon

J mouse and perch

GS010401

Performance Indicator: Determine the genus and species of an organism, given a dichotomous key containing descriptions of the characteristics at each classification level.

89 **The branch below has four leaves. Use the dichotomous key to identify the type of leaves shown in the diagram below.**

1a. Leaves are spiny...................................*Pinus taeda*
1b. Leaves are broad................................Go to 2

2a. Single leaf..Go to 3
2b. Many leaflets......................................Go to 4

3a. Leaf edge is smooth............................*Cornus florida*
3b. Leaf edge is serrated...........................*Ulmus americana*

4a. Leaflet edges are smooth....................*Albizia julibrissin*
4b. Leaflet edges are serrated..................*Juglans nigra*

The leaves belong to which genus and species?

A *Cornus florida*

B *Ulmus americana*

C *Albizia julibrissin*

D *Juglans nigra*

GS020088

90 Use the dichotomous key to classify the organism shown in the diagram below.
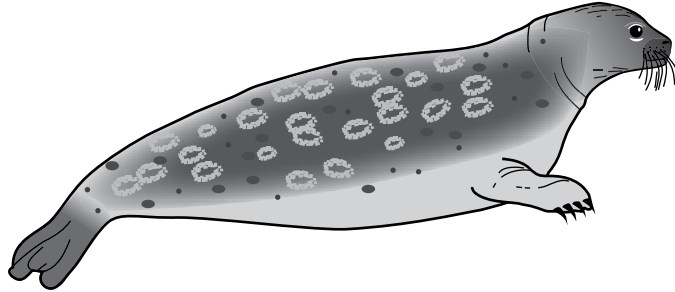
1a. Light colored body with dark spots.......................Go to 2
1b. Dark colored body with light spots.......................Go to 3

2a. Light colored body with black head, huge
    black spot and small black spots on back..............*Phoca vitulina*
2b. Tip of head and all of tail is black, light
    colored body with many black markings...............*Cystophora cristata*

3a. Dark colored body marked with light colored
    pale rings..*Pusa hispida*
3b. Dark colored body with many light colored
    marks, long muzzle...*Halichoerus grypus*

What is the genus and species name of the organism shown in the diagram?

F   *Phoca vitulina*

G   *Cystophora cristata*

H   *Pusa hispida*

J   *Halichoerus grypus*

GS020090

Performance Indicator: Apply knowledge of divergent evolution, as in Darwin's finches, to determine why species with a common ancestor have adapted differently, given a diagram or description.

91 The diagram below shows several species descended from a common ancestor. Following point three, the diagram shows that the giant panda species evolution takes a path different from that of other bear species.

```
                          ┌──────────────┐
                          │ Giant panda  │
                          └──────┬───────┘
         4                       │
   ┌──────────────┐              │
   │  Other bear  │              │
   │   species    │              │
   └──────┬───────┘              │
          │                      │
          └──────────┬───────────┘
                     │
              3 ┌──────────┐
                │ ursidae  │
                └────┬─────┘       2 ┌─────────────┐
                     │               │ procyonidae │
                     │               └──────┬──────┘
                     └──────────┬───────────┘
                                │
                       1 ┌────────────────────┐
                         │  Common ancestral  │
                         │     carnivorans    │
                         └────────────────────┘
```
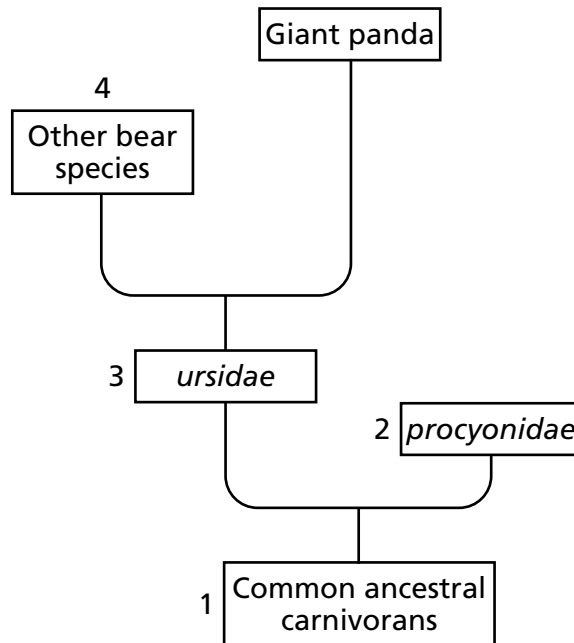
The most likely cause of this change in evolutionary paths is

A a change in the oxygen level in the atmosphere

B an adaptation of the panda to the available food sources

C a decrease in the number of competitive species

D mating between *procyonidae* and *ursidae* species

GS010062

92 **The diagrams below show the limbs of two modern vertebrates that descended from a common ancestor.**
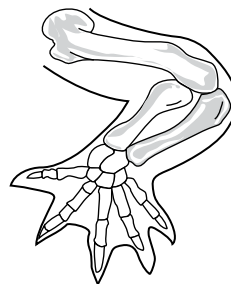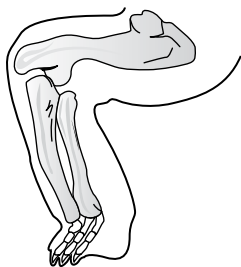
The difference in the structure of the limbs represents an adaptation to their

F gender

G environment

H blood type

J trophic level

GS030008

Performance Indicator: Compare homologous structures in species to determine the relatedness of certain species, given diagrams or pictures.

93 **The diagram below shows the skeletal structure of a whale fin and a bat wing.**

Whale Fin   Bat Wing
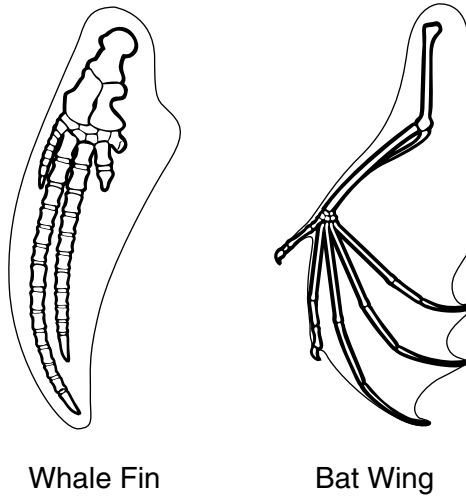
These structures have different functions but develop from the same type of embryonic tissue. These types of structures are

A   vestigial

B   analogous

C   placental

D   homologous

GS010102

94 **The diagrams below show the similarities of the bone structure of two organisms.**

Species 1   **Species 2**
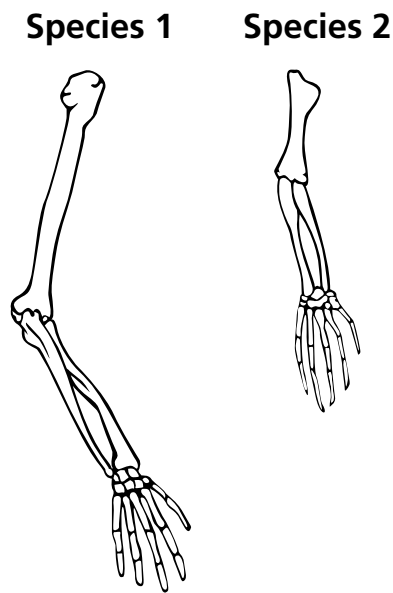
What can <u>most</u> likely be concluded about the relatedness of the two organisms?

F The two organisms have similar strength.

G The two organisms live in a similar climate.

H The two organisms have a common ancestor.

J The two organisms are of the same species.

GS010175

Reporting Category: Diversity: Body Systems and Life Cycles
Numbers 95 through 102

Performance Indicator: Determine whether an insect undergoes complete or incomplete metamorphosis, given pictures, diagrams, or descriptions.

95 **The diagram below shows the complete life cycle of an insect.**
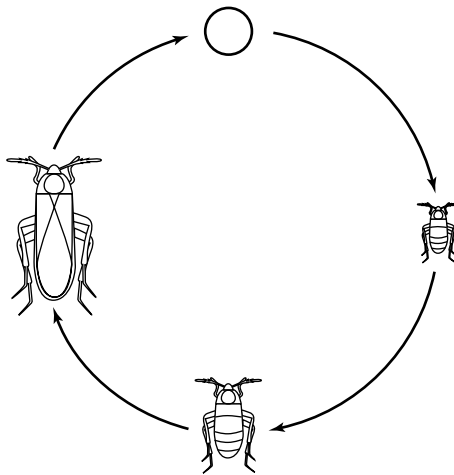
What type of life cycle is shown?

A   regeneration

B   incomplete metamorphosis

C   complete metamorphosis

D   alternation of generations

GS010064

96 **The life cycle of an insect is shown below.**
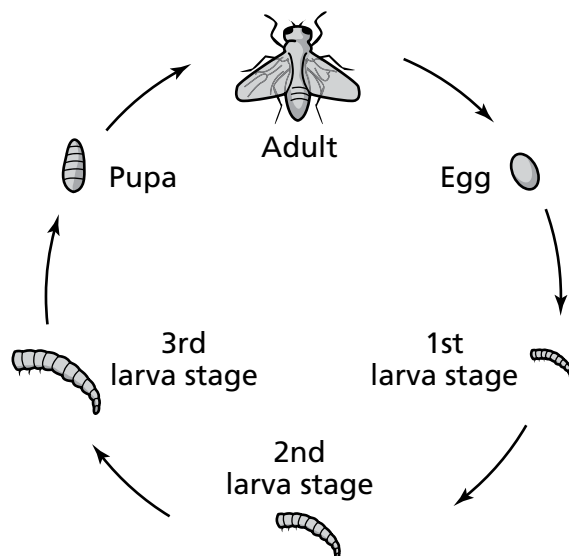
What type of life cycle is represented in the diagram?

F complete metamorphosis

G incomplete metamorphosis

H alternation of generations

J reproductive selection

GS010343

Performance Indicator: Infer the body symmetry of an organism, given a diagram, picture, and/or description.

97 **Which organism shows radial symmetry?**

A
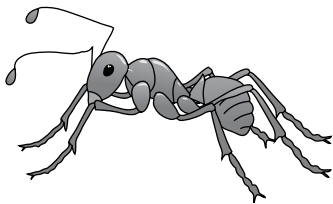
B

C
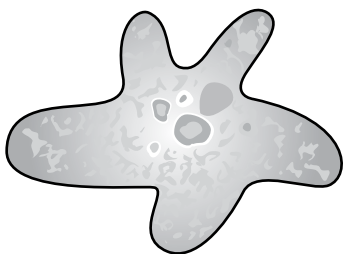
D
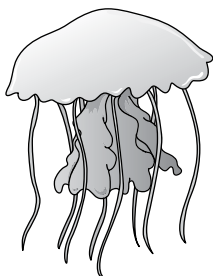
GS010243

98 **A hydra is diagrammed below.**
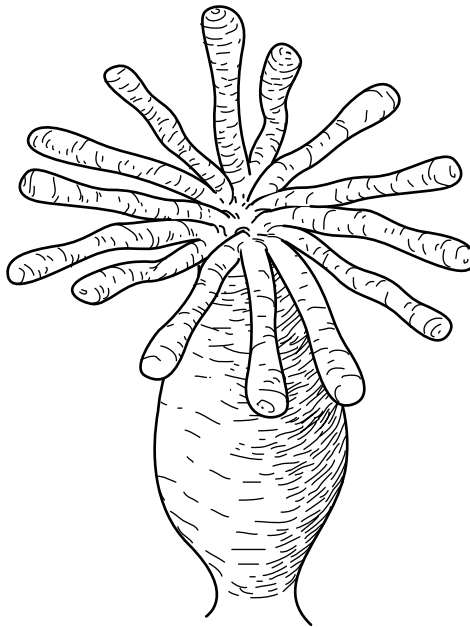
This organism has what type of body symmetry?

F   radial

G   bilateral

H   asymmetrical

J   polar

GS010259

Performance Indicator: Infer the function of a system or organ, given structural descriptions of an earthworm, crayfish, frog, or human.

99 **In humans, a certain organ contains a fluid-filled chamber. This organ also contains specialized receptors.**

What is the function of this organ?

A   to sense taste

B   to sense pressure

C   to sense light

D   to sense sound

GS000836

100 **A human organ has a tube that enters and branches repeatedly inside the organ. The branches end in tiny hollow sacs which are covered by blood vessels.**

What is the <u>most</u> likely function of this organ?

F digestion

G respiration

H circulation

J excretion

GS010346

Performance Indicator: Compare and contrast the life cycles of various organisms to include alternation of generations, given diagrams or pictures.

101 **Study the life cycles below.**

HYDROZOAN LIFE CYCLE   **SEAWEED LIFE CYCLE**

KEY
N: Cells of organism have one set of chromosomes
2N: Cells of organism have two sets of chromosomes
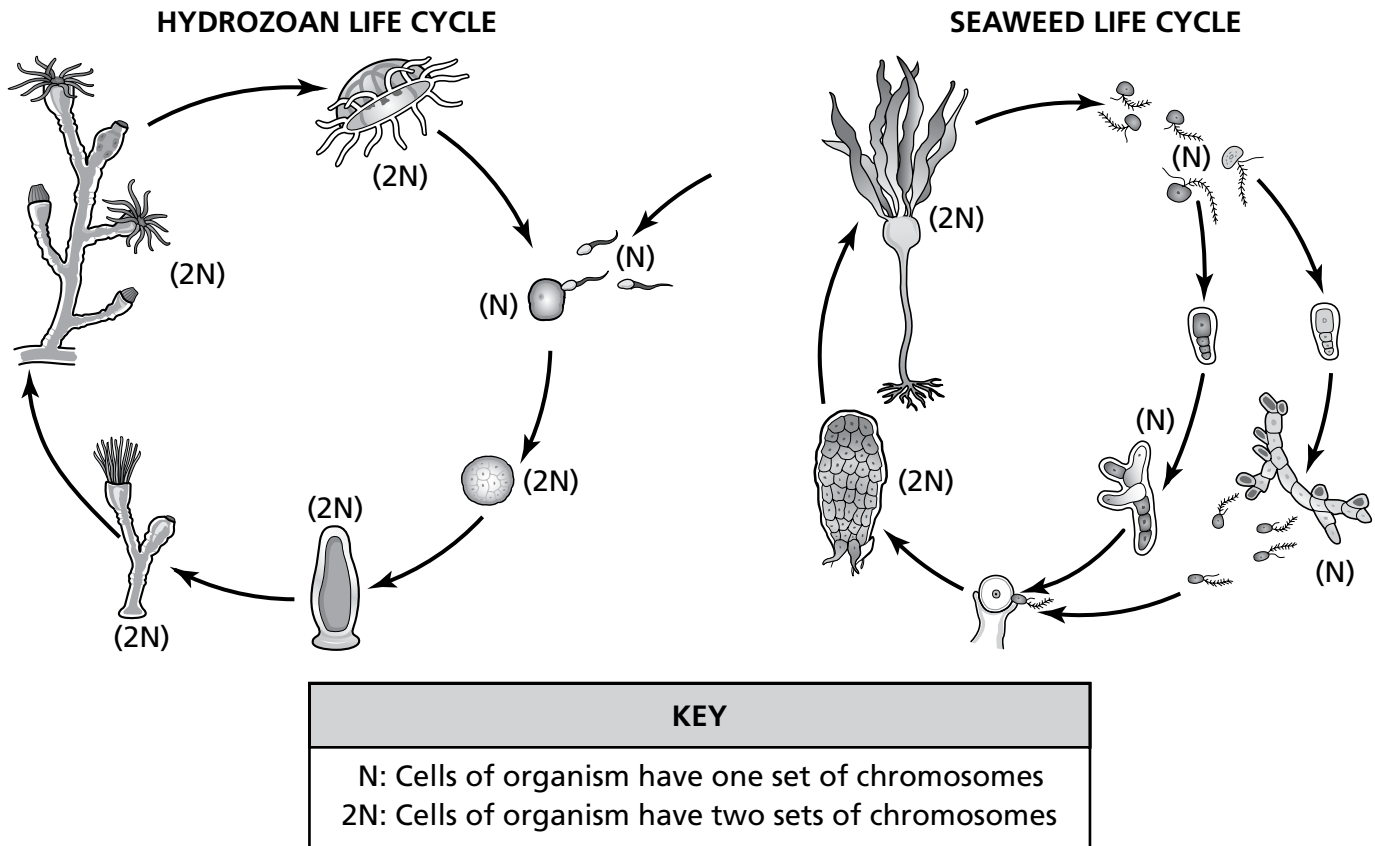
Which of these is a correct statement about the life cycles of the seaweed and the hydrozoan?

A   Meiosis occurs in the seaweed but not in the hydrozoan.

B   Meiosis occurs in the hydrozoan but not in the seaweed.

C   Alternation of generations occurs in the seaweed but not in the hydrozoan.

D   Alternation of generations occurs in the hydrozoan but not in the seaweed.

GS000903

102 **A diagram of alternation of generations is shown below.**
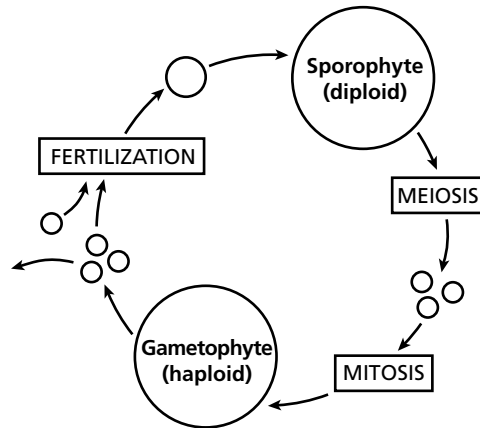
Which statement <u>best</u> describes the gametophyte?

F A haploid structure produces gametes by mitosis.

G A diploid structure produces spores by fertilization.

H A haploid structure produces spores by fertilization.

J A diploid structure produces gametes by mitosis.

GS010118

Answer Key

Reporting Category 1:		Cell Organelles and Biomolecules
Item Number	**Correct Answer**	**Performance Indicator**
1	B	1.A.1 Identify major cell organelles and their functions, given a diagram, description, and/or scenario.
2	G	1.A.1 Identify major cell organelles and their functions, given a diagram, description, and/or scenario.
3	C	1.B.1 Distinguish between plant and animal cells, given diagrams or scenarios.
4	H	1.B.1 Distinguish between plant and animal cells, given diagrams or scenarios.
5	C	1.F.2 Distinguish among proteins, carbohydrates, lipids, and nucleic acids, given structural formulas.
6	J	1.F.2 Distinguish among proteins, carbohydrates, lipids, and nucleic acids, given structural formulas.
7	D	1.G.2 Identify a positive test for carbohydrates and lipids when given an experimental procedure, data, and results.
8	H	1.G.2 Identify a positive test for carbohydrates and lipids when given an experimental procedure, data, and results.
9	B	1.L.3 Identify the biomolecules responsible for communication, response, regulation, or reproduction in the cell.
10	F	1.L.3 Identify the biomolecules responsible for communication, response, regulation, or reproduction in the cell.

Answer Key

Reporting Category 2:		Cell Processes
Item Number	**Correct Answer**	**Performance Indicator**
11	C	1.C.1 Predict the movement of water molecules across a semi-permeable membrane, given a diagram showing solutions of different concentrations.
12	F	1.C.1 Predict the movement of water molecules across a semi-permeable membrane, given a diagram showing solutions of different concentrations.
13	D	1.D.1 Sequence a series of diagrams depicting the movement of chromosomes during the cell cycle.
14	J	1.D.1 Sequence a series of diagrams depicting the movement of chromosomes during the cell cycle.
15	C	1.E.1 Compare and contrast the cell cycle in plant and animal cells, given a diagram or description.
16	F	1.E.1 Compare and contrast the cell cycle in plant and animal cells, given a diagram or description.
17	A	1.H.2 Distinguish between active and passive transport, given examples.
18	H	1.H.2 Distinguish between active and passive transport, given examples.
19	C	1.I.2 Evaluate the role of meiosis in maintaining genetic variability and continuity, given a scenario.
20	F	1.I.2 Evaluate the role of meiosis in maintaining genetic variability and continuity, given a scenario.
21	C	1.J.2 Determine the number of chromosomes following mitosis or meiosis, given the number of chromosomes in the original cell.
22	H	1.J.2 Determine the number of chromosomes following mitosis or meiosis, given the number of chromosomes in the original cell.
23	D	1.K.2 Recognize the importance and the mechanisms of homeostasis to the viability of organisms, given a scenario.
24	G	1.K.2 Recognize the importance and the mechanisms of homeostasis to the viability of organisms, given a scenario.

Reporting Category 3:		Interactions: Between Organisms and Behavior
Item Number	**Correct Answer**	**Performance Indicator**
25	A	2.A.1 Identify commensalism, parasitism, and mutualism, given a scenario with examples.
26	G	2.A.1 Identify commensalism, parasitism, and mutualism, given a scenario with examples.
27	C	2.B.1 Classify an organism as a producer, consumer, or decomposer, given its behavior.
28	G	2.B.1 Classify an organism as a producer, consumer, or decomposer, given its behavior.
29	A	2.C.2 Identify abiotic and biotic factors, given a description or an illustration of an ecosystem.
30	F	2.C.2 Identify abiotic and biotic factors, given a description or an illustration of an ecosystem.
31	D	2.H.3 Distinguish between a learned and innate behavior, given a description of that behavior.
32	G	2.H.3 Distinguish between a learned and innate behavior, given a description of that behavior.
33	A	6.A.1 Differentiate between the relative age of fossils in sedimentary rock, given a diagram, scenario, or description of rock strata.
34	H	6.A.1 Differentiate between the relative age of fossils in sedimentary rock, given a diagram, scenario, or description of rock strata.

Reporting Category 4:		Interactions: Population Dynamics and Energy Flow
Item Number	**Correct Answer**	**Performance Indicator**
35	B	2.D.2 Make inferences about how environmental factors affect population growth, given a scenario.
36	H	2.D.2 Make inferences about how environmental factors affect population growth, given a scenario.
37	A	2.E.2 Examine the energy flow through the trophic levels of an ecosystem, given a diagram and/or scenario.
38	J	2.E.2 Examine the energy flow through the trophic levels of an ecosystem, given a diagram and/or scenario.
39	D	2.F.2 Determine the effects of human activities on ecosystems, given a scenario.
40	G	2.F.2 Determine the effects of human activities on ecosystems, given a scenario.
41	D	2.G.2 Analyze and interpret population growth curves, given graphs.
42	G	2.G.2 Analyze and interpret population growth curves, given graphs.
43	B	6.B.1 Predict how environmental changes affect the formation of a new species or the extinction of an existing species, given a scenario.
44	H	6.B.1 Predict how environmental changes affect the formation of a new species or the extinction of an existing species, given a scenario.
45	C	6.E.2 Differentiate between natural selection and selective breeding, given a scenario.
46	J	6.E.2 Differentiate between natural selection and selective breeding, given a scenario.

Reporting Category 5:		Photosynthesis and Respiration
Item Number	Correct Answer	Performance Indicator
47	B	3.A.1 Identify the reactants and products of photosynthesis and/or respiration, given equations.
48	J	3.A.1 Identify the reactants and products of photosynthesis and/or respiration, given equations.
49	A	3.B.1 Identify the cell organelle in which photosynthesis and respiration occur, given a diagram.
50	J	3.B.1 Identify the cell organelle in which photosynthesis and respiration occur, given a diagram.
51	D	3.C.1 Interpret a diagram of the carbon–oxygen cycle.
52	H	3.C.1 Interpret a diagram of the carbon–oxygen cycle.
53	D	3.D.2 Distinguish between aerobic and anaerobic respiration in terms of the presence or absence of oxygen and ATP produced.
54	J	3.D.2 Distinguish between aerobic and anaerobic respiration in terms of the presence or absence of oxygen and ATP produced.
55	D	3.E.2 Investigate the interdependence of photosynthesis and respiration in living organisms, given a diagram or scenario.
56	H	3.E.2 Investigate the interdependence of photosynthesis and respiration in living organisms, given a diagram or scenario.
57	A	3.F.3 Relate how energy is transferred from cellular energy to cellular work.
58	G	3.F.3 Relate how energy is transferred from cellular energy to cellular work.

Reporting Category 6:		Genetics
Item Number	**Correct Answer**	**Performance Indicator**
59	C	4.A.1 Distinguish between asexual and sexual methods of reproduction, using a scenario.
60	J	4.A.1 Distinguish between asexual and sexual methods of reproduction, using a scenario.
61	A	4.B.1 Identify dominant and recessive traits, given the results of a monohybrid cross in a scenario.
62	G	4.B.1 Identify dominant and recessive traits, given the results of a monohybrid cross in a scenario.
63	A	4.C.1 Determine the genotype and phenotype of a monohybrid cross, given a Punnett square.
64	G	4.C.1 Determine the genotype and phenotype of a monohybrid cross, given a Punnett square.
65	A	4.F.2 Identify the sex chromosomes in humans and recognize inheritance patterns that are sex-linked (X-linked), using a pedigree or scenario.
66	F	4.F.2 Identify the sex chromosomes in humans and recognize inheritance patterns that are sex-linked (X-linked), using a pedigree or scenario.
67	C	4.G.2 Analyze modes of inheritance including co-dominance, incomplete dominance, polygenic, and multiple alleles using genetic problems or Punnett squares.
68	J	4.G.2 Analyze modes of inheritance including co-dominance, incomplete dominance, polygenic, and multiple alleles using genetic problems or Punnett squares.
69	B	4.I.2 Determine the probability of having a child with an autosomal disorder, such as cystic fibrosis or Tay-Sachs, given a scenario or genetic problem.
70	G	4.I.2 Determine the probability of having a child with an autosomal disorder, such as cystic fibrosis or Tay-Sachs, given a scenario or genetic problem.
71	B	4.K.3 Analyze a dihybrid cross to determine the probability of a particular trait, given a completed Punnett square.
72	G	4.K.3 Analyze a dihybrid cross to determine the probability of a particular trait, given a completed Punnett square.

Answer Key

Reporting Category 7:		Biotechnology and DNA
Item Number	Correct Answer	Performance Indicator
73	C	4.D.1 Relate changes in the DNA instructions that cause mutations, given diagrams.
74	J	4.D.1 Relate changes in the DNA instructions that cause mutations, given diagrams.
75	C	4.E.2 Recognize the major functions of DNA as replication or transcription, (and translation) given diagrams and/or descriptions.
76	F	4.E.2 Recognize the major functions of DNA as replication or transcription, (and translation) given diagrams and/or descriptions.
77	C	4.H.2 Analyze DNA fingerprinting using an illustration of DNA (bands).
78	J	4.H.2 Analyze DNA fingerprinting using an illustration of DNA (bands).
79	A	4.J.3 Differentiate the processes of replication, transcription, and translation, given descriptions and/or diagrams.
80	F	4.J.3 Differentiate the processes of replication, transcription, and translation, given descriptions and/or diagrams.
81	C	6.F.3 Recognize the relatedness of species using illustrations of anatomical structures, protein sequences, and/or DNA bands.
82	F	6.F.3 Recognize the relatedness of species using illustrations of anatomical structures, protein sequences, and/or DNA bands.

Reporting Category 8:		Diversity: Biomes and Classification
Item Number	Correct Answer	Performance Indicator
83	C	5.A.1 Infer animals or plants indigenous to an environment, given pictures or diagrams of the organisms and a description of the environment.
84	G	5.A.1 Infer animals or plants indigenous to an environment, given pictures or diagrams of the organisms and a description of the environment.
85	D	5.B.1 Infer the biome in which an animal or plant lives, given a description of the organism and pictures of various biomes.
86	H	5.B.1 Infer the biome in which an animal or plant lives, given a description of the organism and pictures of various biomes.
87	B	5.C.1 Infer the relatedness of different organisms using the Linnaean system of classification, given pictures and/or descriptions of a variety of different plants or animals and a classification key.
88	J	5.C.1 Infer the relatedness of different organisms using the Linnaean system of classification, given pictures and/or descriptions of a variety of different plants or animals and a classification key.
89	A	5.D.2 Determine the genus and species of an organism, given a dichotomous key containing descriptions of the characteristics at each classification level.
90	H	5.D.2 Determine the genus and species of an organism, given a dichotomous key containing descriptions of the characteristics at each classification level.
91	B	6.C.2 Apply knowledge of divergent evolution, as in Darwin's finches, to determine why species with a common ancestor have adapted differently, given a diagram or description.
92	G	6.C.2 Apply knowledge of divergent evolution, as in Darwin's finches, to determine why species with a common ancestor have adapted differently, given a diagram or description.
93	D	6.D.2 Compare homologous structures in species to determine the relatedness of certain species, given diagrams or pictures.
94	H	6.D.2 Compare homologous structures in species to determine the relatedness of certain species, given diagrams or pictures.

Reporting Category 9:		Diversity: Body Systems and Life Cycles
Item Number	**Correct Answer**	**Performance Indicator**
95	B	5.E.2 Determine whether an insect undergoes complete or incomplete metamorphosis, given pictures, diagrams, or descriptions.
96	F	5.E.2 Determine whether an insect undergoes complete or incomplete metamorphosis, given pictures, diagrams, or descriptions.
97	D	5.F.2 Infer the body symmetry of an organism, given a diagram, picture, and/or description.
98	F	5.F.2 Infer the body symmetry of an organism, given a diagram, picture, and/or description.
99	C	5.G.2 Infer the function of a system or organ, given structural descriptions of an earthworm, crayfish, frog, or human.
100	G	5.G.2 Infer the function of a system or organ, given structural descriptions of an earthworm, crayfish, frog, or human.
101	C	5.H.3 Compare and contrast the life cycles of various organisms to include alternation of generations, given diagrams or pictures.
102	F	5.H.3 Compare and contrast the life cycles of various organisms to include alternation of generations, given diagrams or pictures.